Ordering number: EN3515A

Monolithic Digital IC



LB1638, 1638M



Low-Saturation Bidirectional Motor Drive for Low-Voltage Applications

Overview

The LB1638, 1638M are low-saturation bidirectional motor driver ICs for use in low-voltage applications. At an I_O of 500 mA, they have a low saturation output of V_O (sat) = 0.75 V. They are especially suited for use in compact motor of portable equipment.

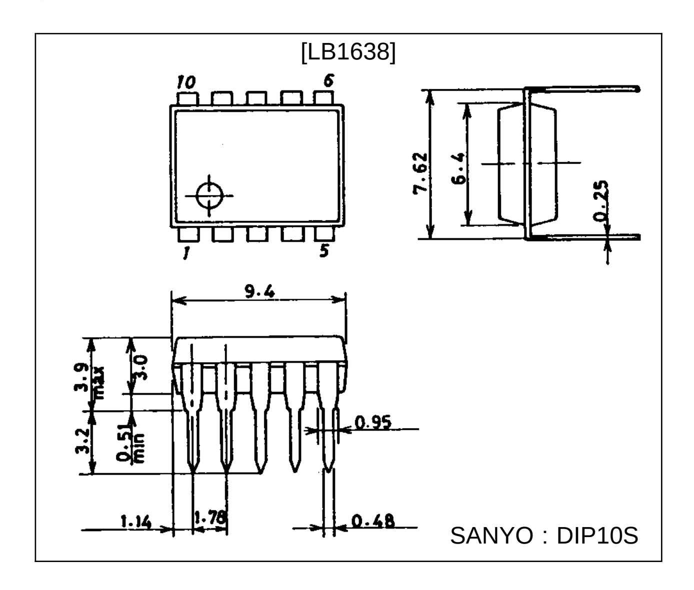
Features

- Low voltage operation (2.5 V min.)
- Low saturation voltage (upper transistor + lower transistor residual voltage; at I_O = 500 mA, V_O(sat) = 0.75 V typ.)
- Low current drain at standby mode (I_{CCO} = 0.1 µA typ. or less)
- Separate logic power supply and motor power supply
- Brake function
- Built-in spark killer diodes
- Compact package (MFP-10S) suited for surface mounting.

Package Dimensions

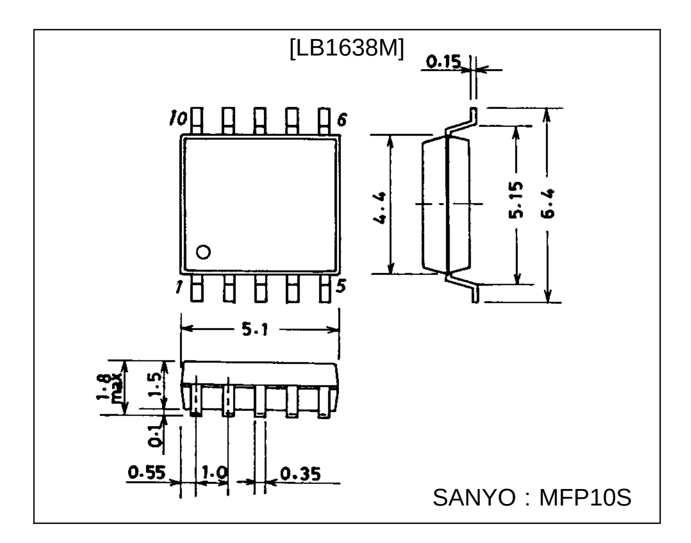
unit : mm

3098B-DIP10S



unit : mm

3086A-MFP10S



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Specifications

Absolute Maximum Ratings at Ta = 25 °C

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	V_{CC} max		–0.3 to +10.5	V
	V_S max		–0.3 to +10.5	V
Output applied voltage	V_{OUT}		–0.3 to V_S + VF	V
Input applied voltage	V_{IN}		–0.3 to +10.0	V
Ground pin flow-out current	I_{GND}		1.0	A
Allowable power dissipation	Pd max	LB1638	1.0	W
		LB1638M: Independent IC	440	mW
		LB1638M: *With board	550	mW
Operating temperature	Topr		–20 to +75	°C
Storage temperature	Tstg		–40 to +125	°C

* Specified board (30 × 30 × 1.5 mm^3 glass epoxy)

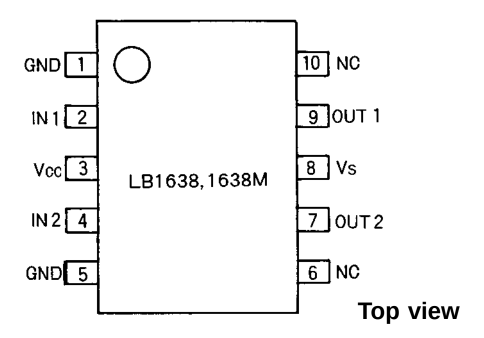
Allowable Operating Ranges at Ta = 25 °C

Parameter	Symbol	Conditions	Ratings	Unit
Supply voltage range	V_{CC}		2.5 to 9.0	V
	V_S		2.2 to 9.0	V
Input high-level voltage	V_{IH}		2.0 to 9.0	V
Input low-level voltage	V_{IL}		–0.3 to +0.7	V

Electrical Characteristics at Ta = 25 °C, V_{CC} = V_S = 3 V

Parameter	Symbol	Conditions		min	typ	max	Unit
Current drain	$I_{CC}0$	V_{IN} 1, 2	I_{CC} + I_S			10	µA
	$I_{CC}1$	V_{IN} 1 = 3 V, V_{IN} 2 = 0 V	I_{CC} + I_S			20	mA
	$I_{CC}2$	V_{IN} 1, 2 = 3 V	I_{CC} + I_S			40	mA
Output saturation voltage (upper + lower)	$V_{OUT}1$	I_{OUT} = 200 mA			0.25	0.5	V
	$V_{OUT}2$	I_{OUT} = 500 mA			0.70	1.3	V
Output pin voltage difference		I_O = 200 mA				0.1	V
Output sustain voltage	V_O (sus)	I_{OUT} = 500 mA		9			V
Input current	I_{IN}	V_{IN} = 7 V, V_{CC} = 7 V				0.5	mA
[Spark killer diode]							
Reverse current	I_S (leak)	V_{CC}, V_S = 7 V				10	µA
Forward voltage	V_{SF}	I_{OUT} = 200 mA				1.7	V

Pin Assignment

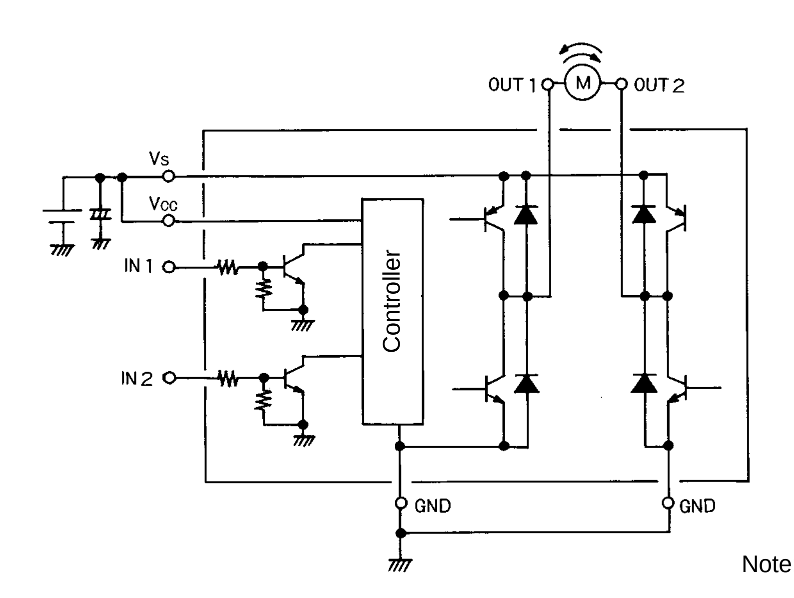


Note: both ground pins must be grounded.

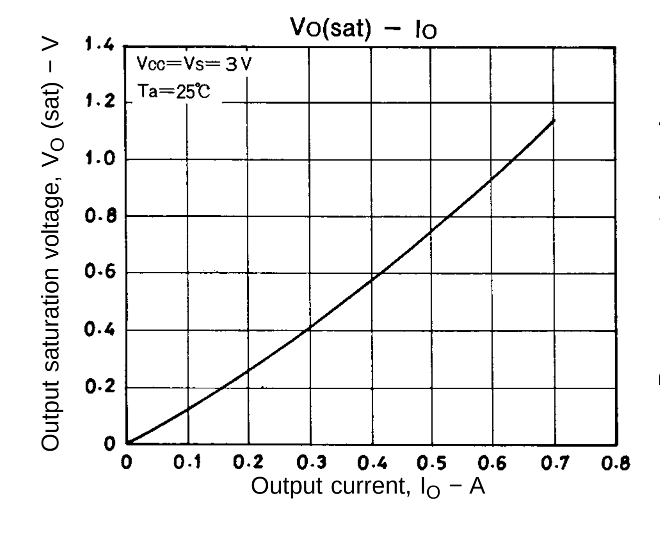
Truth Table

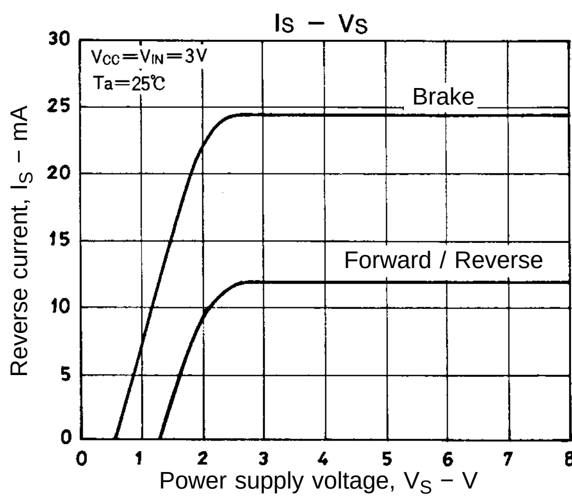
IN 1	IN 2	OUT 1	OUT 2	Mode
H	L	H	L	Forward
L	H	L	H	Reverse
H	H	L	L	Brake
L	L	OFF	OFF	Standby

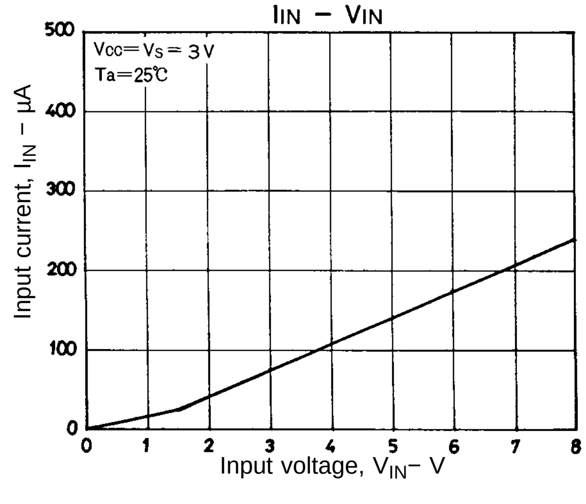
Sample Application Circuit

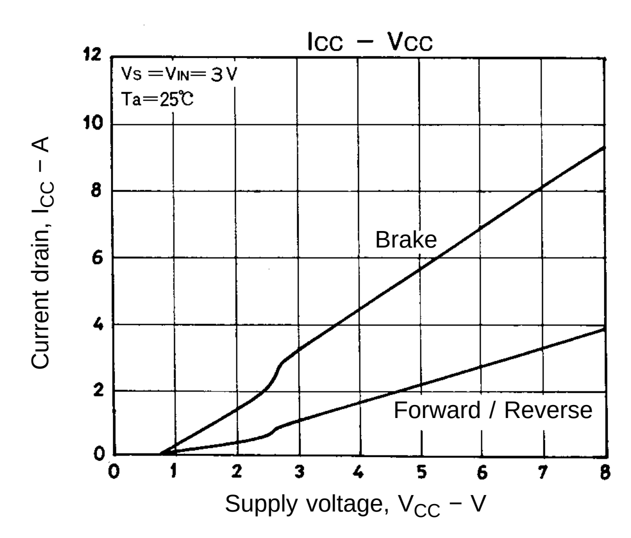


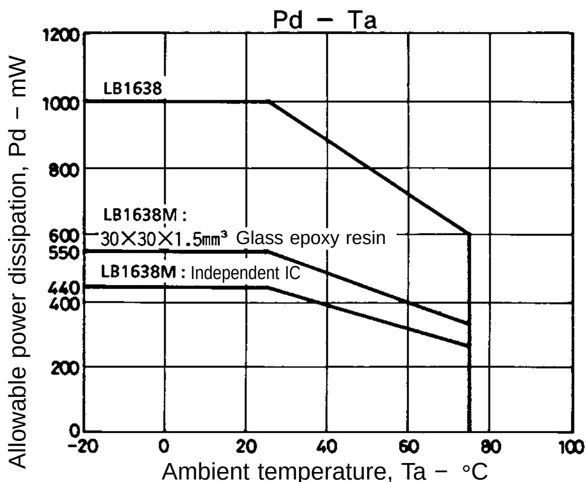
Note: When using the same power supply for V_S and V_{CC}, short the V_{CC} and V_S pins to each other or insert a capacitor in the V_{CC} line.











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